REMARKS

Claims 1-5, 9-15 and 19-23 are pending in this Application. All claims stand rejected.

Claims 1-3, 9, 11, 12, 19 and 21-23 have been amended to correct obvious errors. Specifically, base Claims 1, 11 and 21-23 have been amended to make clear that the claimed "multi-layer mathematical model of a proposed information system architecture" is constructed and implemented on a computer. Support for this amendments is found at least on page 4, lines 3-8 of the Specification as originally filed. The base claims have also been amended to correct limitations regarding constructing the layers of the mathematical model, support for which is found on page 7, lines 6-15 of the Specification as originally filed. Further, the amended base claims now include the corrected limitation that the multi-layer mathematical model includes the claimed "technology bus" and "application bus." Support for this amendment is found at least on page 10, line 27 - page 11, line 6 of the Specification as originally filed. With this Amendment, no new matter is added; acceptance is respectfully requested.

Regarding the claim interpretation noted by Examiner, Applicants note that the claim limitation "technology bus" is described in the Specification at page 13, lines 3-13, as modeling "an abstract interface...for data access or technology services," which manages communication between the component models in the application layer 430 and technology layer 450 (see Fig. 4). A "virtual machine" is stated as being an example of an "abstract interface," which could be modeled by the technology bus.

Further, the claim limitation "application bus" is described in the Specification at page 12, lines 5-18, as modeling an interface that directs "all communication between software components" in the business layer 410 and the application layer 430 (see Fig. 4). The application bus models "communication services" such as "network communication protocol translation services," "distribution services" and "security services" that would facilitate this communication.

Claim 21 has been amended as described above, and as a result is believed to be fully supported by the specification.

Rejection of Claims 1-5, 9-15 and 19-23 under 35 U.S.C. § 112

Claims 1-5, 9-15 and 19-23 have been rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Base Claims 1, 11 and 21-23 have been amended, as described above, and to correct obvious errors and to clarify the claimed subject matter. The base claims as amended are now directed to "constructing a multi-layer mathematical model of a proposed information system architecture." It should now be clear that embodiments of the invention construct a mathematical model, rather than physically constructing an information system. It is believed, therefore, that Claims 1-5, 9-15 and 19-23 now meet the requisites of § 112, and removal of the § 112 rejection is respectfully requested.

Moreover, the Specification describes how such a mathematical model may be constructed. A system architect may utilize computer-aided design tools with a series of graphical user interfaces to construct an initial mathematical model of a system architecture (Specification, page 4, lines 1-5). Using a business process design, the invention may provide a selectable list of premodeled business applications, which are coupled to models of hardware and software components. The selected business applications and corresponding hardware and software models are then assembled as a model of an information system architecture, as shown for example in Fig. 4. The construction may be completed by mapping the business processes to the selected business applications, which determines how performance of the mathematical model may be modeled (Specification, page 4, lines 5-14). Thus, the claim limitations in base Claims 1, 11 and 21-23, in the same or similar language, "constructing a multi-layer mathematical model of a proposed information system architecture," is enabled by the Specification.

Rejection of Claims 1-5, 9-15 and 19-23 under 35 U.S.C. § 103

Claims 1-5, 9-15 and 19-23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over "EUROEXPERT - Best Practices: French Social Security" UNEDIC dated 1992 in view of the IEEE article — "An Introduction to Six Sigma With Design Example" by Robert White dated 1992, and further in view of U.S. Patent No. 6,532,465 to Hartley et al. Applicants respectfully disagree with this rejection for the reasons set forth below.

The present invention as now claimed designs an information system architecture based on a multi-layer mathematical model of the information system architecture. The mathematical model includes a business layer, an application layer and a technology layer, which further include component models selected to perform a number of desired business processes (Specification, page 11, lines 14-17). A technology bus and application bus are additional layers modeled to provide an interface between the business, application and technology layers. The mathematical model is evaluated by modeling its performance, and comparing this modeled performance against the business requirements defined for the business processes of interest. The model may be modified and further evaluated in order to meet the defined business requirements. Once the business requirements are satisfied, the resulting mathematical model embodies the proposed system architecture (page 10, lines 18-29). That is, a design of the proposed information system architecture is derived from the resulting model (page 4, lines 14-16). The invention therefore designs an information system architecture, which may further be output as a design specification for building an information system (page 8, lines 17-26).

The aforementioned multi-layer mathematical model not only predicts (models) performance of a proposed information system architecture, but also predicts application component behavior (component level performance) in the proposed information system architecture. Moreover, the mathematical model includes two buses (a technology bus and an application bus) that provide interfacing and management between the component models of the business, application and technology layers. These buses provide portability in the mathematical model by enabling a range of different component models to communicate through compatible channels (page 13, lines 6-13).

On page 9 of the Office Action at hand (dated January 29, 2007), the EUROEXPERT reference is stated as failing to teach "specifically modeling the performance [metrics] for each layer, simulating, comparing them to the requirements, acceptability, proposing & modifying the [metrics] at appropriate layers." The Six Sigma article by White is set forth as disclosing "...how Six-Sigma methodology can be used to perfect any process, system or component..." and "[simulating] components...to measure their performance using various mathematical & statistical calculation."

However, White merely teaches a general methodology for testing and improving a system or process, and describes an example unrelated to the present invention. Applicant agrees that the techniques of simulation and analyzing simulation results are known in the prior art. Yet the general concepts of simulation and analyzing do not suggest the modeling performance metrics and modifying the multi-layer mathematical model of the present invention. In particular, the circuit simulation disclosed in White is provided by a specific software tool (Monte Carlo), which cannot be applied to modeling the performance of an information system architecture. White fails to provide any suggestion of modeling performance of an information system architecture. Moreover, mere suggestion of a "simulation" would not enable one of ordinary skill to model performance of an information system architecture as claimed because such modeling requires several techniques (e.g., mapping business processes to business application models, creating buses to interface between component models) that are not taught in the prior art. Thus, no combination of EUROEXPERT and White teaches or suggests modeling performance metrics of a mathematical model of an information system architecture, as recited in base Claims 1, 11 and 21-23.

Further, on page 10 of the subject Office Action, the EUROEXPERT reference and White are stated as failing to teach "mapping between the 3 GATE domain layers and presence of application and technology buses in the design." Accordingly, Hartley is set forth as teaching "mapping between the different layers..." as well as a "technology bus as [a] virtual machine...and application bus as [a] message bus."

Contrary to these assertions, however, the claim limitation "mapping each business process to an application component" (now amended as "business application component") does not mean "mapping between the different layers [of the mathematical model]." Rather, the business processes are operations performed by a business, and by mapping the business processes to components of the mathematical model, the invention can predict how the mathematical model performs those business processes (Specification, page 7, line 26 – page 8, line 12). Thus, Hartley fails to teach "mapping each business process to a business application component" as recited in base Claims 1, 11 and 21-23; nor does EUROEXPERT or White suggest this claim limitation.

Hartley also fails to teach a "technology bus" and "application bus" as claimed. As described above, the technology bus and application bus are models of hardware and software that facilitate communication between component models in different layers of the multi-layer mathematical model of the information system architecture, as illustrated for example in Fig. 4. Hartley teaches a "virtual machine" as a virtual computer environment for operating each of the objects in the multi-tiered system (Hartley, col. 10, lines 22-31). The "virtual machine" of Hartley is not an abstract interface for data access or technology between business and application components of a mathematical model of an information system architecture. Rather, the "virtual machine" is merely an allocation of computing resources for running each of the objects shown in Fig. 4, where each of the objects contains logic and rules for processing data and communicating with other objects (Hartley, col. 10, lines 34-57). Hartley fails to suggest modeling data access or technology services for communication between hardware and software component models, and therefore fails to suggest a "technology bus" as recited in base Claims 1, 11 and 21-23.

Likewise, Hartley does not teach an "application bus" as claimed. Hartley discloses, in Fig. 5, a message bus 61 that is merely a passive communication channel between an application server 52 and an object server 56. In contrast, the "application bus" of the present invention models tools for providing a communication, distribution and management interface between component models in the application layer and business layer. Examples of these modeled tools include protocol translation services (e.g., Java to Cobol; TCP/IP to SNA), tools for distributing a workload across applications, and tools for scheduling and dispatching service requests (Specification, page 12, lines 8-18). By modeling these tools in the application bus, embodiments of the invention can model communication between component models in the business layer and applications layer, thereby modeling performance of the mathematical model of the information system architecture. No such "application bus," either modeled or physical, is taught by Hartley; nor is it taught or suggested by EUROEXPERT or White.

In conclusion, no combination of EUROEXPERT, White or Hartley teaches or suggests an application bus, a technology bus, or mapping business processes to business application components as recited in base Claims 1, 11 and 21-23. Because these limitations are integral to modeling performance metrics of the mathematical model, it follows that none of these

references teach or suggest "modeling performance metrics for each layer of the multi-layer model" as recited in base Claims 1, 11 and 21-23.

Claims 2-5, 9, 10, 12-15, 19 and 20 depend from one of base Claims 1 and 11 and thus the foregoing applies. As a result, the § 103 rejection of Claims 1-5, 9-15 and 19-23 cannot stand, and Applicant respectfully requests it be withdrawn.

Information Disclosure Statement

An Information Disclosure Statement (IDS) was filed on February 23, 2007. Entry of the IDS is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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